Course Outline

Course Code   : RE2708
Course Title   : Computational Thinking and Programming for Real Estate
Semester   : Semester 1, Academic Year 2023/2024
Faculty   : Associate Professor Badarinza Cristian
Department   : Real Estate
Email   : Cristian.badarinza@nus.edu.sg

Overview

This course introduces fundamental concepts in computational thinking and basic programming techniques (VBA and Python) to Real Estate (RE) students. It aims to strengthen students' quantitative skills and problem-solving capability necessary to lead the future of the real estate and urban planning industry. Topics covered include problem solving by computing, basic problem formulation and problem solving, program development, coding, testing and debugging, fundamental programming constructs, fundamental data structures, simple file processing, basic recursion, and basic data visualization techniques. Students will apply their skills to solve practical problems in real estate and urban planning.

Learning Outcomes

Through this course, students will be able to:

- Formulate a practical problem into a programmable computational process.
- Understand how to decompose a problem into programming components such as input, output, and variable.
- Understand how to write Visual Basic for Applications codes to extend the functionality and replicability of the spreadsheet modelling.
- Be familiar with coding fundamentals such as variables, data types, operators, conditionals, loops, etc.
- Translate computational thinking into programming flow within Python/Jupyter Notebook environment.
- Understand and summarize a problem with visualization using Python.
- Be equipped with fundamental Python coding skills to deal effectively with big data.
- Be familiar with the efficient computational thinking process that integrates live code, equations, visualizations, and narrative text through the use of the Jupyter Notebook App.
- Develop real estate and urban planning models using Python.

Course Prerequisite(s)

Nil

Course Preclusion(s)

Nil

General Guide & Reading

Nil

Tentative Schedule & Outline

Week	Date	Topic	Activity
1	14 – 18 Aug	Course Introduction	
2	21 – 25 Aug	User-defined functions in VBA I	
3	28 Aug – 1 Sep	User-defined functions in VBA II	
4	4 – 8 Sep	Logical flow using subroutines	Quiz 1
5	11 – 15 Sep	Application	Tutorial 1 (Odd week)
6	18 – 22 Sep	Fundamentals of Data Storage and Data Processing	Tutorial 1 (Even week); Individual Project submission
	23 Sep – 1 Oct	**RECESS WEEK**	
7	2 – 7 Oct	Fundamentals of Python	
8	9 – 13 Oct	PANDAS Module for Data analysis	Tutorial 2 (Even week)
9	16 – 20 Oct	MATPLOTLIB Module for Visualization	Tutorial 2 (Odd week); Quiz 2
10	23 – 27 Oct	Application: Hedonic pricing regression	Tutorial 3 (Even week)
11	30 Oct – 3 Nov	Application: DCF Model and Monte Carlo Simulation	Tutorial 3 (Odd week); Quiz 3
12	6 – 10 Nov _#NUS Wellness Day on 10 Nov_	Application: GIS	Tutorial 4 (Even week)
13	13 – 17 Nov _#Deepavali (Make up) on 13 Nov_	Application: Final Project and Final Review	Tutorial 4 (Odd week); Group Project submission
	18 – 24 Nov	**READING WEEK**	
	25 Nov – 9 Dec	**EXAMINATION (2 WEEKS)**	

Assessment

Assessment Components	Weightage (%)
Individual Project	30
Group Project	40
3 x Multiple Choice quizzes @ 10% each	30
Total	**100**

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Academic integrity and honesty is essential for the pursuit and acquisition of knowledge. The University and School expect every student to uphold academic integrity & honesty at all times. Academic dishonesty is any misrepresentation with the intent to deceive, or failure to acknowledge the source, or falsification of information, or inaccuracy of statements, or cheating at examinations/tests, or inappropriate use of resources.

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being presented as entirely your own work. This is a minimum standard. In case of any doubt, you should consult your instructor.

Additional guidance is available at:

- http://www.nus.edu.sg/registrar/administrative-policies-procedures/acceptance-record#NUSCodeofStudentConduct
- http://nus.edu.sg/osa/resources/code-of-student-conduct

About me

I am an Associate Professor at the National University of Singapore, a Research Fellow of the Institute of Real Estate Studies, and a Network Associate of the Centre for Economic Policy Research, London. My research interests are in the areas of real estate finance, household finance and financial economics. Previously, I have been a Postdoctoral Fellow at Saïd Business School, University of Oxford, a Research Assistant in the Monetary Policy Research Division of the European Central Bank in Frankfurt am Main. I have obtained a PhD and an MSc in Economics from Goethe University, Frankfurt am Main.